USER MANUAL

EDECOA®

HYBRID INVERTER / CHARGER

MODEL:

EM-352A

EM-654A

VERSION:2.3

Language: English**/**Deutsch/Français/Español/Italiano

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Table Of Contents

ABOUT THIS MANUAL

This manual describes the assembly, installation, operation and troubleshooting of this unit. Please read this manual carefully before installation and operations. Keep this manual for future reference.

This manual provides safety and installation guidelines as well as information on tools and wiring.

SAFETY INSTRUCTIONS

1. Before using the unit, read all instructions and cautionary markings on the unit, the batteries, and all appropriate sections of this manual.

2. **CAUTION** --To reduce the risk of injury, charge only deep-cycle lead acid-type rechargeable batteries. Other types of batteries may burst, causing personal injury and damage.

3. **DO NOT** disassemble the unit. Take it to a qualified service center when service or repair is required. Incorrect re-assembly may result in a risk of electric shock or fire.

4. To reduce the risk of electric shock, disconnect all wirings before attempting any maintenance or cleaning. Turning off the unit will not reduce this risk

5. **CAUTION** - Only qualified personnel can install this device with battery.

6. **NEVER** charge a frozen battery.

7. For optimum operation of this inverter/charge, please follow the required specs to select the appropriate cable size. It's very important to correctly operate this inverter/ charger.

8. Be very cautious when working with metal tools on or around batteries. A potential risk exists to drop a tool to spark or short circuit batteries or other electrical parts which could cause an explosion.

9. Please strictly follow the installation procedure when you want to disconnect AC or DC terminals. Please refer to the INSTALLATION section of this manual for the details.

10. **GROUNDING INSTRUCTIONS** -This inverter/charger should be connected to a permanent grounded wiring system. Be sure to comply with local requirements and regulation to install this inverter.

11. NEVER cause AC output and DC input short-circuited. **DO NOT** connect to the mains when DC input short circuits.

12. **Warning!!** Only qualified service persons are able to service this device. If errors still persist after following the troubleshooting table, please send this inverter/charger back to the local dealer or service center for maintenance.

INTRODUCTION

This is a multifunctional off-grid photovoltaic inverter, integrating an MPPT photovoltaic charge controller, a high-frequency pure sine wave inverter, and a UPS function module. It is very suitable for off-grid backup power and self-generation systems. The high-frequency transformer design allows the machine to provide reliable power conversion even under minimal size. This inverter can also operate without batteries.

The entire system requires other devices to achieve complete operation, such as photovoltaic modules, generators or public grids. Please consult your system integrator according to your requirements to obtain other possible system components that may be needed. The Wi-Fi module is a plug-and-play monitoring device installed on the inverter. With this device, users can monitor the operation of the photovoltaic system anytime and anywhere through their mobile phones or websites.

Features

- Pure sine wave solar inverter
- Double AC output design –one for main load and one for emergency backup
- Built-in MPPT, working range 55-430V, maximum open-circuit voltage 450V
- RGB led lights – indicating different working modes
- Configurable AC/Battery input priority via LCD setting
- Auto restart while PV is recovering
- Over-load, over temperature and output short circuit protection
- Cold start function
- Built-in lithium battery automatic activation – better usage of your lithium batteries.
- RS485 for communication with BMS of lithium batteries.
- Wi-Fi monitoring function (optional)
- Built-in clock – configurable utility charging timing and quantifiable solar power generation
- Off-line upgrading function – COM port for software upgrade
- No-battery mode available

Basic System Architecture

The following illustration shows the basic application for this inverter/charger. It also includes the following devices to have a complete running system.

- Generator or Utility.
- PV modules (option)

Consult with your system integrator for other possible system architectures depending on your requirements.

This inverter can power all kinds of appliances in the home or office environment, including motor-type appliances such as tube light, fan, refrigerator and air conditioner.
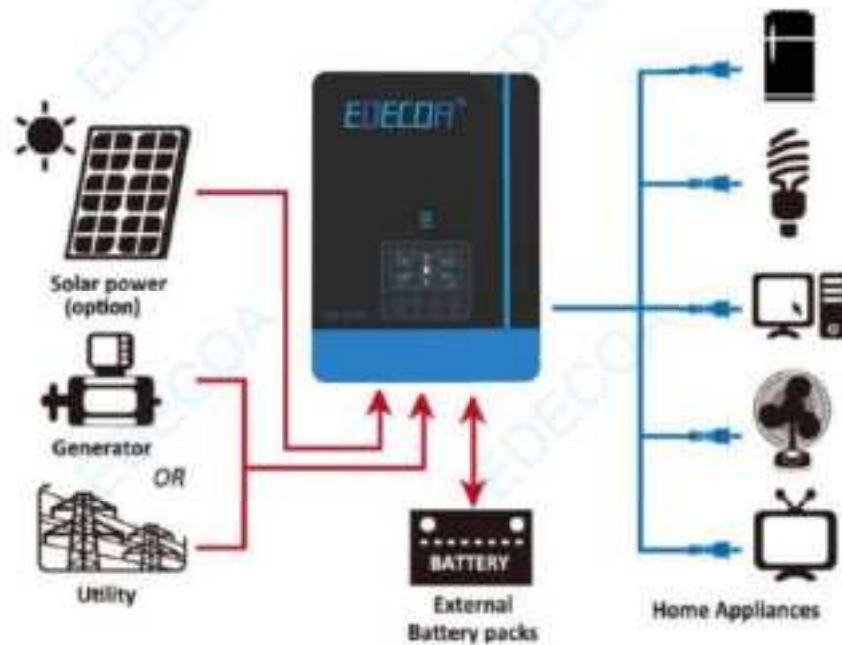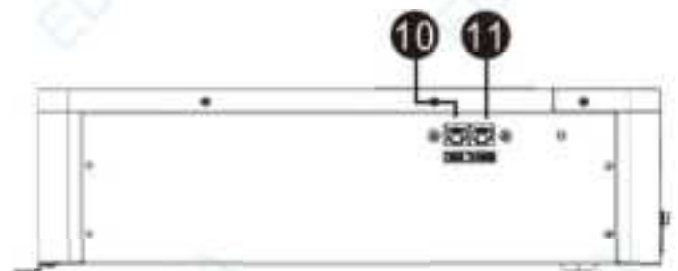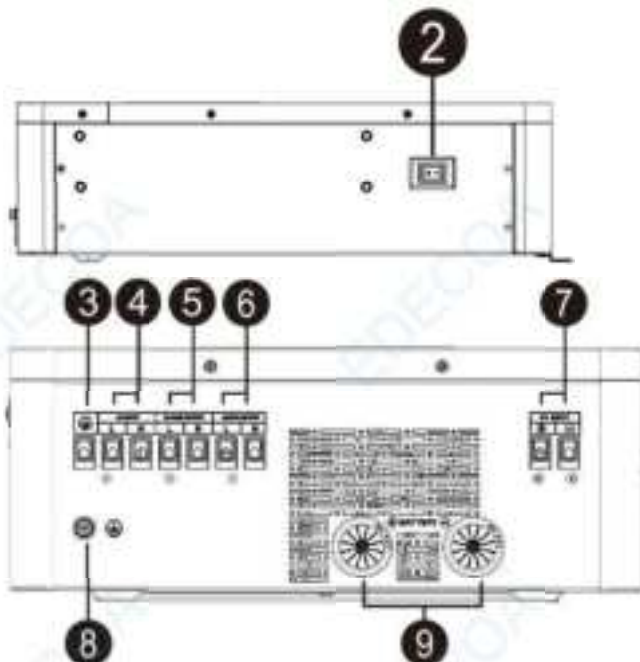
Figure 1 Hybrid Power System

Product Overview

1. LCD display and buttons
2. Power on/off switch
3. Ground
4. AC input
5. AC main output
6. AC Emergency Power Supply output
7. PV input
8. Ground
9. Battery input
10. BMS port
11. RS485 communication port

OPERATION

Power ON/OFF

Once the unit has been properly installed and the batteries are connected well, simply press the ON/OFF switch (located on the right side of the case) to turn on the unit.

Operation and Display Panel

The operation and display panel, shown in the below chart, is on the front panel of the inverter. It includes three indicators, four function keys, and an LCD display, indicating the operating status and input/output power information.
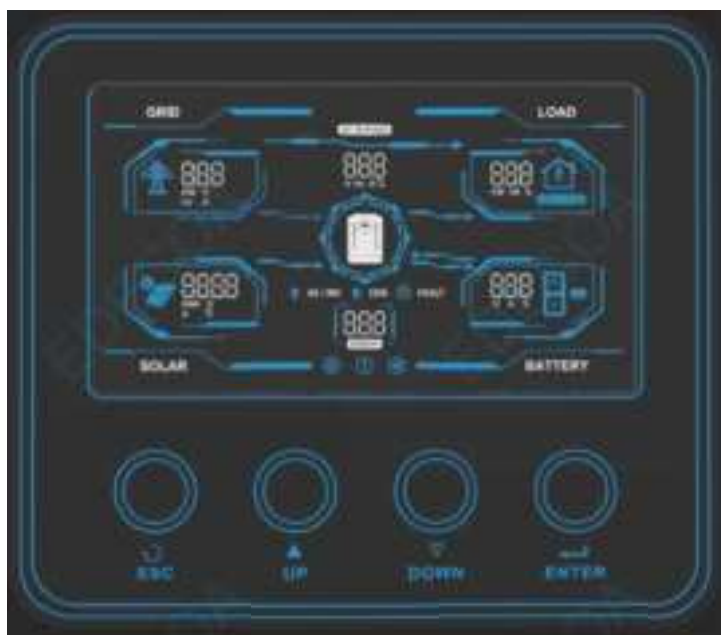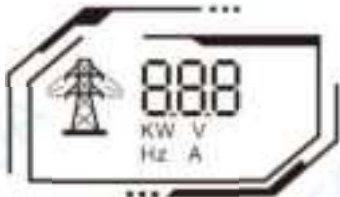
LED Indicator

LED Indicator		Messages
AC / INV	Solid On	Output is powered by utility in Line mode.
	Flashing	Output is powered by battery or PV in battery mode.
CHG	Solid On	Battery is fully charged.
	Flashing	Battery is charging.
FAULT	Solid On	Fault occurs in the inverter.
	Flashing	Warning condition occurs in the inverter.

Function keys

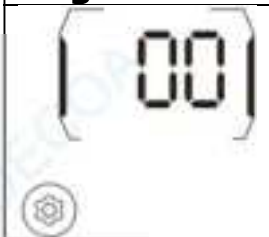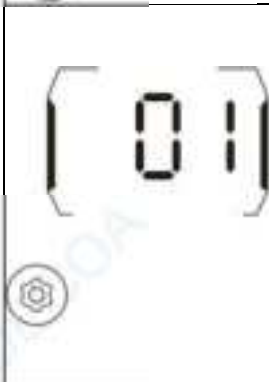| Function Key	Description
ESC	To exit current page
UP	To go to previous selection
DOWN	To go to next selection
ENTER	To confirm the selection in setting mode or enter setting mode

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LCD Display Icons

Icon	Description
AC Input Information	
	AC input, voltage and frequency
AC BYPASS	AC bypass providing power
PV Input Information	
	PV input, power, voltage and current
Output Information	
	Icon of the inverter
	Output voltage, output frequency, output current and temperature
Load Information	
	Load (in kW or in VA) and load percentage
OVER LOAD	Overload warning
Battery Information	
	Battery, battery voltage, current and capacity percentage.
Li	Lithium battery connected
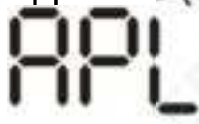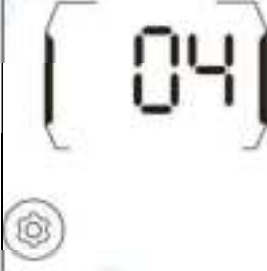
Configuration Program and Fault Information	
888 (with gear icon)	Program setting
888 (with ! icon)	Warning and fault codes.
888 ERROR	Fault code
(muted speaker icon)	Alarm muted.

LCD Setting
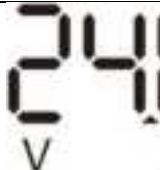
Press and hold ENTER button for 5 seconds to enter setting mode. Press "UP" or "DOWN" button to select setting programs. Press "ENTER" button to confirm the selection or ESC button to exit.

Program	Description	Selectable option	
00 (with gear icon)	Exit setting mode	Escape **ESC**	
01 (with gear icon)	Output source priority: To configure load power source priority	(Default) **Sub**	Solar energy provides power to the loads as a priority. If solar energy is not sufficient to power all connected loads; utility energy will be the next supplement.
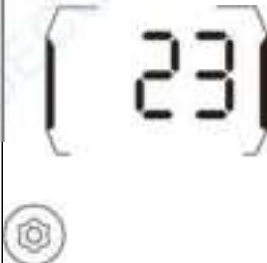
		SbU	Solar energy provides power to the loads as a priority. If solar energy is not sufficient to power all connected loads; battery will be the next supplement. Battery low voltage warning is programmable in Program 13.
02 ⚙	Maximum total charging current	**10A** **10** A	**110A** **110** A
		Default charging current 80A, setting range is 10A – 110A. (Max. charging current = utility charging current (10-80A, program 11) + solar charging current)	
03 ⚙	AC input voltage range	Appliance (default) **APL**	AC input voltage range becomes within 90 -265VAC.
		UPS mode **UPS**	AC input voltage range becomes within 170 - 265VAC.
04 ⚙	*Power saving mode	Saving mode disable (default) **SdS**	If disabled, no matter connected load is low or high, the on/off status of inverter output will not be affected.
		Saving mode enable **SEn**	If enabled, the output of inverter will be off when connected load is too low or not detected

		AGM (default) **AGn**	Flooded **FLd**
05 ⚙	Battery type	User-Defined **USE**	If "User-Defined" is enabled, battery charge voltage can be set up in program 26, 27 and 29
		Lithium-ion battery **LIb**	After setting to "LIB", the floating charge will be cancelled. Once LIB is enabled, battery charging voltage and DC cut-off voltage can be set up in program 26 and 29 respectively.
		Communication with Lithium battery: **LIb** **485** If"485"is selected here, Program 12, 13 and 29 will display SOC.	
06 ⚙	Auto restart when overload occurs	Restart disabled (default) **Lrd**	Restart enabled **LrE**
07 ⚙	Auto restart when over temperature occurs	Restart disabled **trd**	Restart enabled **trE**
08 ⚙	Output voltage	220V **220** V	230V(default) **230** V
		240V **240** V	The setting range is 100-240V, **DO NOT change this setting except professional personnel**

09 ⚙	Output frequency	50Hz (default) **50**	60Hz **60**
10 ⚙	Battery producers (optional)	**PYL**	**PAC**
		If your batteries were not from Pylontec or Paceex, please disregard this program.	
11 ⚙	Maximum utility charging current (Setting range 11-80A)	UE 1 80A **11** ⚙	
		UE 1 11A **11** ⚙	
12 ⚙	When "SBU priority" in Program 01 is selected, you can set the voltage of switching back to utility here. When battery voltage is lower than setting value, power supply will be switched back to utility.	Available options for EM-352A: 22.0 – 25.5V, 23.0V by default.	
		22.0V **220** V	25.5V **255** V
		Available options for EM-654A: 44.0 – 51.0V, 46.0V by default.	
		44.0V **440** V	51.0V **510** V
13 ⚙	When "SBU priority" in Program 01 is selected, you can set the voltage of switching back	Available options for EM-352A: 24.0 – 29.0V, 27.0V by default.	
		240 V	**290** V
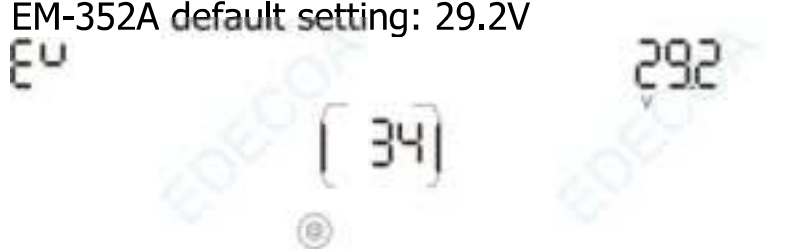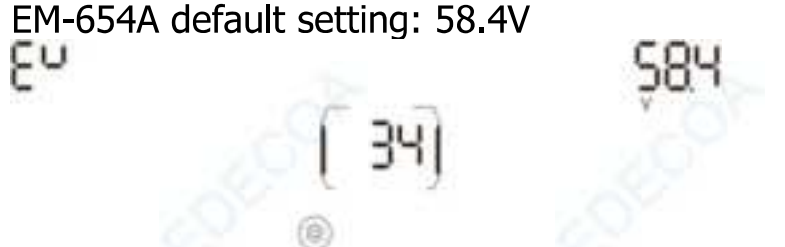
	to batteries here. When battery voltage is higher than setting value, power supply will be switched back to batteries.	Available options for EM-654A: 48.0 – 58.0V, 54.0V by default.
		48.0 V / **58.0** V
		When fully charged: **FUL**
16 ⚙	Charger source priority: To configure charger source priority	**If this inverter/charger is working in Line, Standby or Fault mode, charger source can be programmed as below:**
		Solar and Utility (default) **SNU** — Solar energy and utility will charge battery at the same time.
		Solar only **OSO** — Solar energy will be the only charger source regardless utility is available or not.
		Solar first **CSO** — Solar energy will charge batteries as first priority. Utility will charge battery only when solar energy is not available.
		If this inverter/charger is working in Battery mode or Power saving mode, only solar energy can charge battery. Solar energy will charge battery if it's available and sufficient.
17 ⚙	For factory use only, please disregard this one.	
18 ⚙	Alarm control	Alarm on (default) **bON** Alarm off **bOF**
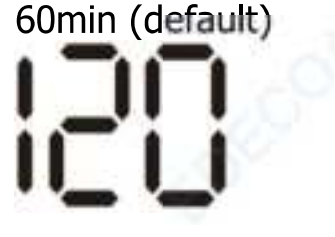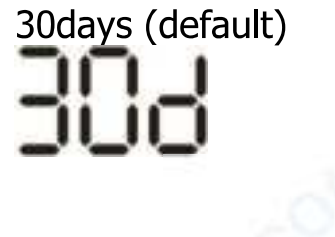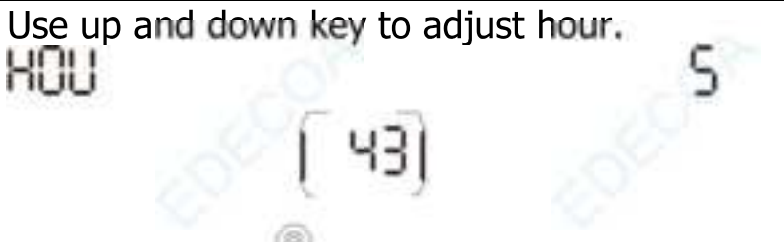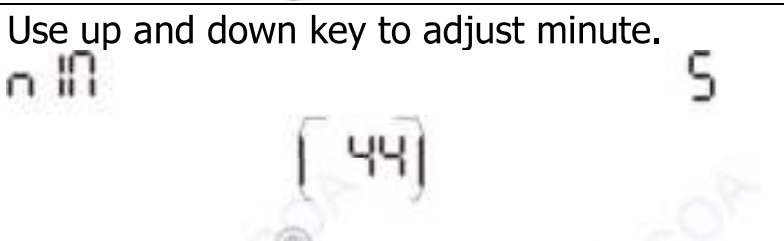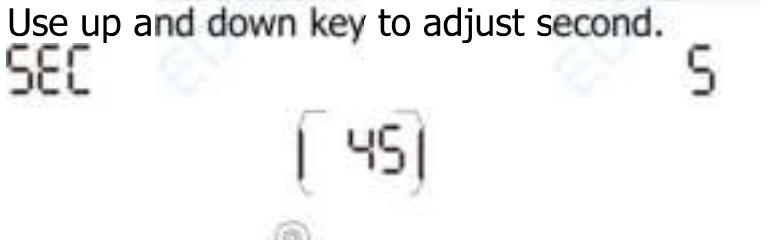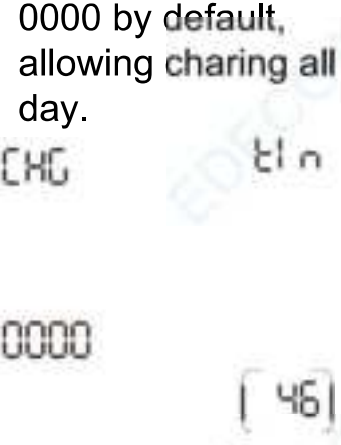
19 ⚙	Auto return to default display screen	**Return to default display screen (default)** ESP	If enabled, no matter how users switch display screen, it will automatically return to default display screen (Input voltage /output voltage) if no operation for 1 minute.
		Stay at latest screen tEP	If enabled, the display screen will stay at latest screen user finally switches.
20 ⚙	Backlight control	**Backlight on (default)** LON	**Backlight off** LOF
22 ⚙	Beeps while primary source is interrupted	**Alarm on (default)** AON	**Alarm off** AOF
23 ⚙	When this function is enabled, if overload occurs in battery mode, inverter will switch to AC by-pass mode	**By-pass disabled (default)** bYd	**By-pass enabled** bYE
25 ⚙	Record Fault code	**Record disabled (default)** FdS	**Record enabled** FEN
	Bulk charging voltage (C.V voltage)	EM-352A default setting for AGN battery: 28.2V	

13
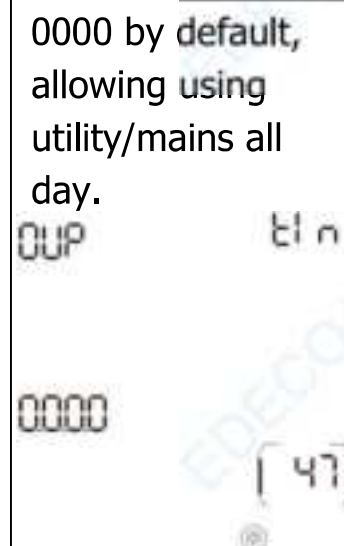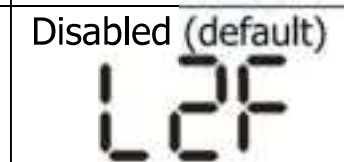
![26]		Cu 28.2 [26]
		EM-654A default setting: 56.4V Cu 56.4 [26]
		If USE or LIB is enabled in program 05, charging voltage can be adjusted. The setting range is from 24.0V to 29.2V for EM-352A and 48.0V to 58.4V for EM-654A. Increment of each click is 0.1V.
![27]	Floating charging voltage	EM-352A default to 27.0V FLu 27.0 [27]
		EM-654A default setting:54.0V FLu 54.0 [27]
		If USE or LIB is enabled in program 5, this program can be set up. Setting range is from 24.0V to 29.2V for EM-452A, and 48.0V to 58.4V for EM-654A. Increment of each click is 0.1V.
![29]	Low DC cut-off voltage	EM-452A default setting: 21.0V CDu 21.0 [29]
		EM-654A default setting: 42.0V

		COᵛ 420 ⌈29⌋ ⊚
		If "485"is selected in program 5, Program 29 will indicate a percentage. The default value is 20%. The value ranges from 5% to 30%.
		If self-defined is selected in program 5, this program can be set up. The setting range is from 20.0V to 24.0V for EM-452A, and 40.0V to 48.0V for EM-654A. Increment of each click is 0.1V. Low DC cut-off voltage will be fixed to setting value no matter what percentage of load is connected.

⌈33⌋ ⊚	Battery equalization	Disabled (Default) EdS	Activated EEΠ
		Only if "Flooded" or "User-Defined" was selected in program 05, this program can be set up.	

⌈34⌋ ⊚	Battery equalized voltage	EM-352A default setting: 29.2V Eᵛ 292 ⌈34⌋ ⊚
		The setting range is from 25.0V to 29.5V. Increment of each click is 0.1V.
		EM-654A default setting: 58.4V Eᵛ 584 ⌈34⌋ ⊚
		The setting range is from 50.0V to 59V. Increment of each click is 0.1V.

`[35]` ⚙	Battery equalized time	60min (default) **60**	Setting range is from 5min to 900 min. Increment of each click is 5 min.
`[36]` ⚙	Battery equalized timeout	60min (default) **120**	Setting range is from 5min to 900 min. Increment of each click is 5 min.
`[37]` ⚙	Equalization interval	30days (default) **30d**	The setting range is from 0 to 90 days. Increment of each click is 1 day
`[39]` ⚙	Equalization activated immediately	Disabled (default) **AdS** Enabled **AEn** If equalization function is enabled in program 33, this program can be set up. If "Enable" is confirmed in this program, it's to activate battery equalization immediately and LCD main page will show "**E9**". If "Disable" is confirmed, it will cancel equalization function until next activated equalization time arrives based on program 37 setting. At this time, "**E9**" will not be shown in LCD main page.	
`[40]` ⚙	Time setting: Year	2023 `[40]` ⚙	The setting range is 2023-2099
`[41]` ⚙	Time setting: Month	Use up and down key to adjust month. nOn 5 `[41]`	

42 ⚙	Time setting: Day	Use up and down key to adjust day. dAY S 42 ⚙	
43 ⚙	Time setting: Hour	Use up and down key to adjust hour. HOU S 43 ⚙	
44 ⚙	Time setting: Minute	Use up and down key to adjust minute. n iN S 44 ⚙	
45 ⚙	Time setting: Second	Use up and down key to adjust second. SEC S 45 ⚙	
46 ⚙	Utility charging hours	0000 by default, allowing charing all day. CHG tI n 0000 46 ⚙	Use the 4 digits for charging hours setting: the first 2 digits represent starting hour and the last 2 digits represent ending hours. For example, 2320 means starting charging from 23:00 and ending at 20:00 the second day.

47	Load time of utility power	0000 by default, allowing using utility/mains all day. OUP tI n 0000 47	Use the 4 digits to set up timing of using utility/mains power for loads. The first 2 digits represent starting hour and the last 2 digits represent ending hours. For example, 2320 means starting charging from 23:00 and ending at 20:00 the second day.
48	RGB light mode	RGB lights ON (default) LON	RGB lights OFF LOF
49	Double-output	Disabled (default) L2F	Enabled L2N
		If double-output is enabled, when low-voltage occurs, inverter will cut off main-output until battery voltage recovers to setting value in program 13.	
50	On-grid	Urd Disabled (default)	UrE Enabled
		If enabled, PV energy output will be charging battery first, then the rest of it will be returned to grid.	

Lithium battery connection

If the inverter is matched with lithium batteries, only lithium batteries that have been matched with the BMS communication protocol are allowed to be used:

Please follow below steps to implement lithium battery connection:

1. Assemble battery ring terminal based on recommended battery cable and terminal specifications.

2. Insert the ring terminal of battery cable flatly into battery connector of inverter and make sure that the bolts are tightened with a torque of 2-3Nm. Make sure polarity at both the battery and the inverter/charge is correctly connected and ring terminals are

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tightly screwed to the battery terminals.

3. Connect the RJ45 connector to the COMM port on the inverter.

4. Connect the other end of the RJ45 plug to the battery communication port (RS485).

Note: If choosing lithium battery, make sure you have connected the BMS communication cable between the battery and the inverter. You need to choose battery type as "LIB-485"mode in program 05.

Lithium battery communication and setting

In order to communicate with battery BMS, you should set the battery type to "485" in Program 5.

1. Connect the end of RJ45 of battery to BMS communication port of inverter

Ensure that the BMS port of the lithium battery corresponds to the pin of the BMS communication

port of the inverter. The pin of the inverter BMS interface is defined as shown in the following figure:

Pin number	Port definitions
1	RS485B
2	RS485A
3	NG
4	NG
5	NG
6	NG
7	RS485A
8	RS485B
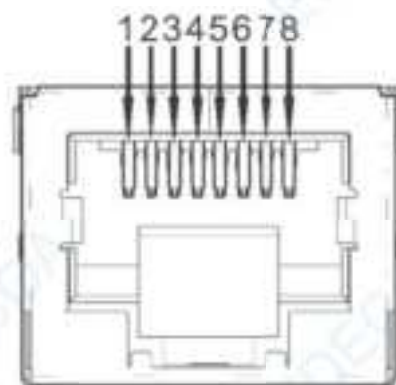
2. Press ENTER for 5 seconds, enter program setting 05 and set battery type to LIB-485.

05	Battery type	AGM (default)
		Flooded
		User-Defined

| | | Lithium-ion battery

LIb | |
| | | Lib 485

LIb   485 | |

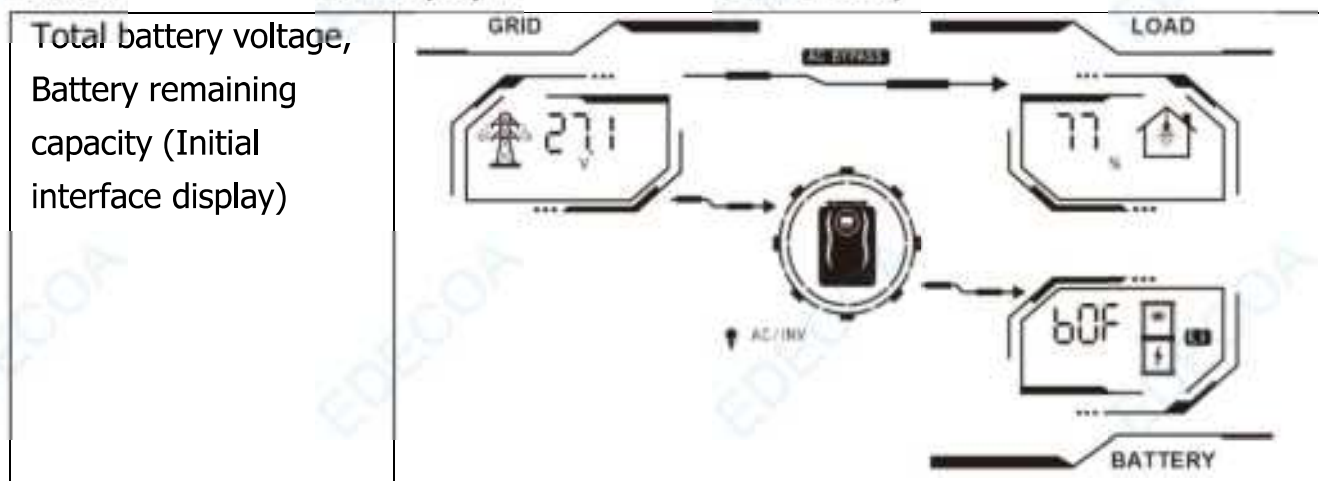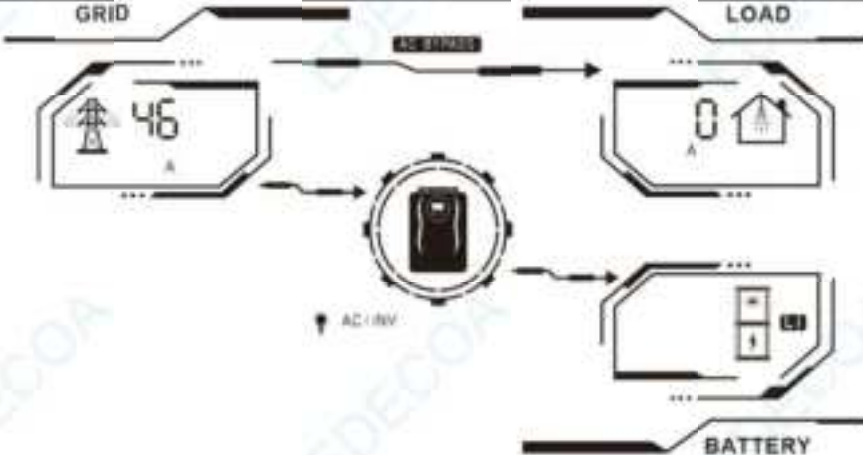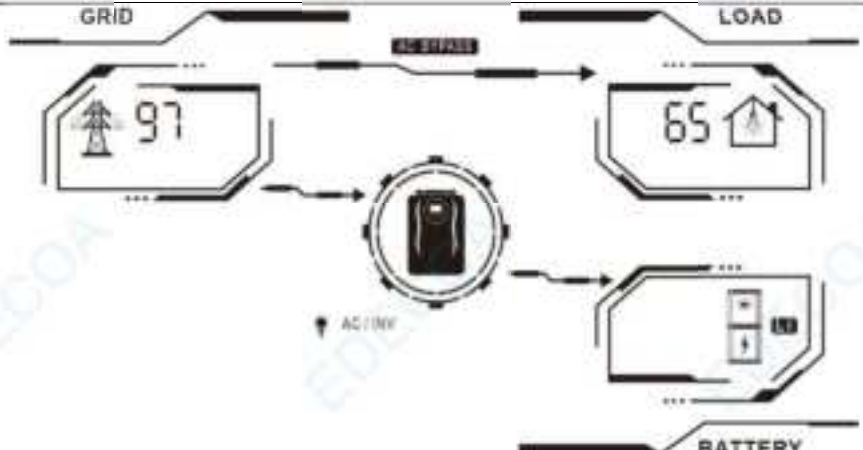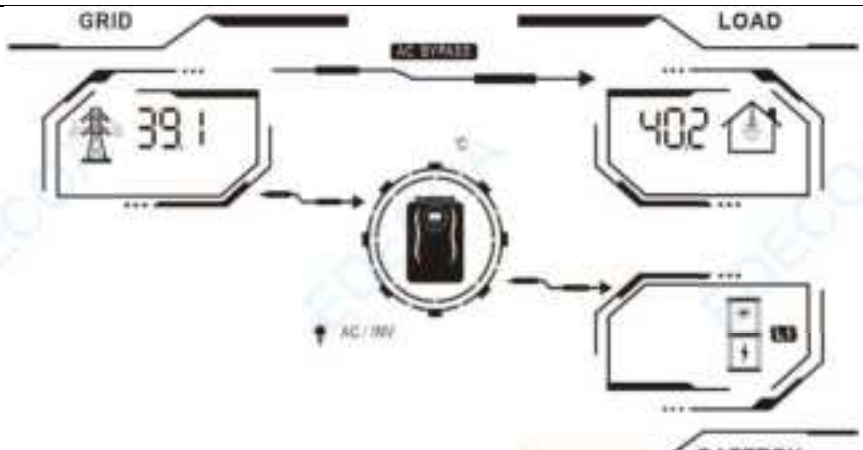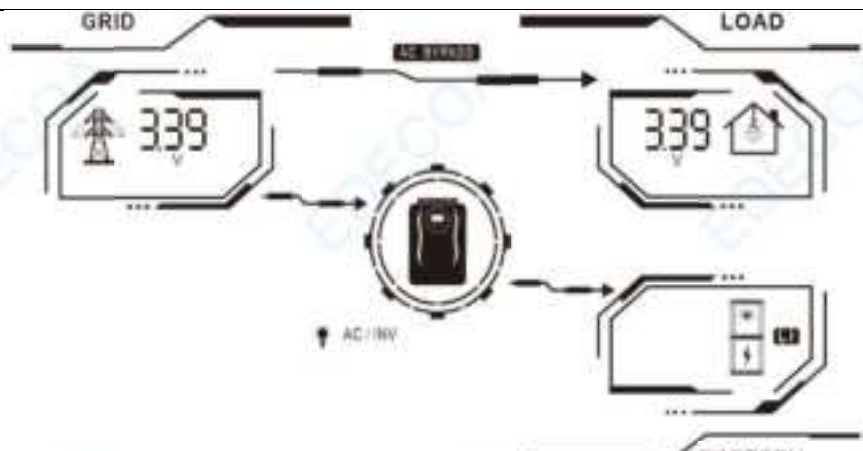**Note:** When the battery type is set to 485, the charge current can't be modified by the user. The inverter will cut off output if communication fails.

12	When "SBU" in Program 01 is enabled, set up the voltage where inverter switches to utility/mains input.	**50%**	Battery percentage ranges from 10%-50%
13	When "SBU" in Program 01 is enabled, set up the voltage where inverter switches to battery input.	**95%**	Battery percentage ranges from 30%-100%
29	Low DC cut-off voltage	**20%**	Battery percentage ranges from 5%-30%

3. Long press ESC key to the initial screen to check battery voltage and remaining battery level.

4.Detailed description of display interface for lithium battery

Total battery voltage, Battery remaining capacity (Initial interface display)	

Battery charging current, Battery discharge current	
Battery capacity, Battery charger/discharge Times	
BMS board temperature and MOSFET temperature of BMS board	
Maximum voltage of a single bailey cell, Minimum voltage of a single battery cell	

Maximum temperature of a single battery cell; Minimum temperature of a single battery cell	
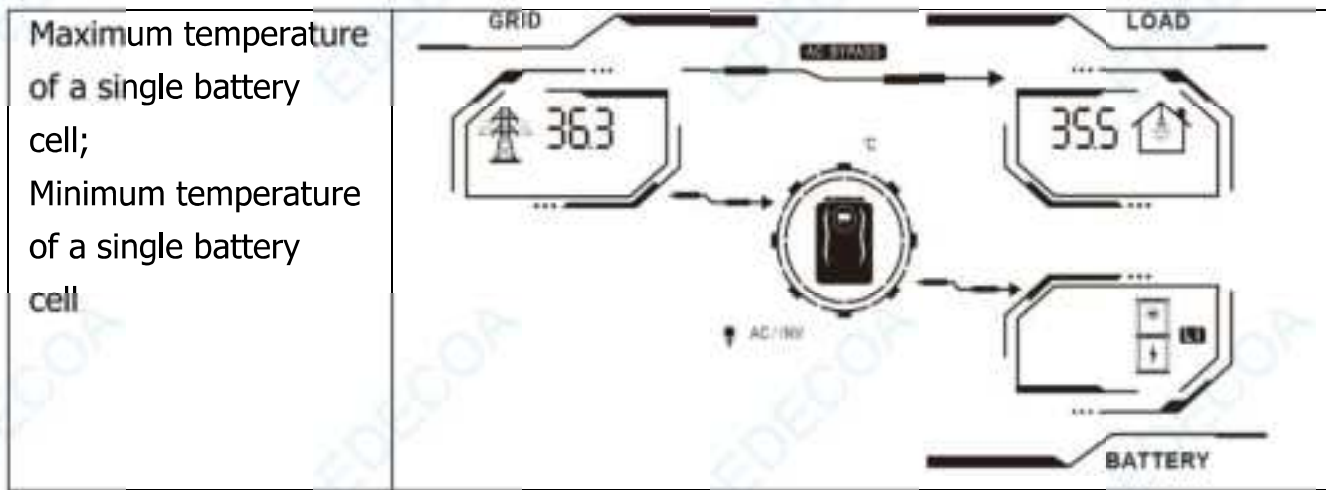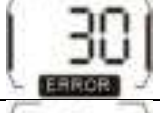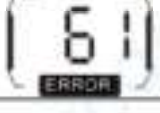
5. Warning Code

Warning Code	Warning Event	Warning Icon
21	Battery cell over-voltage	21
22	Battery cell low-voltage	22
24	Single battery cell low-voltage	24
25	Charging over-current	25
26	Discharging over-current	26
27	Charging cell high temperature	27
28	Discharging cell high temperature	28
29	Charging cell low temperature	29
30	Discharging cell high temperature	30

34	Low capacity of battery	[34] ①
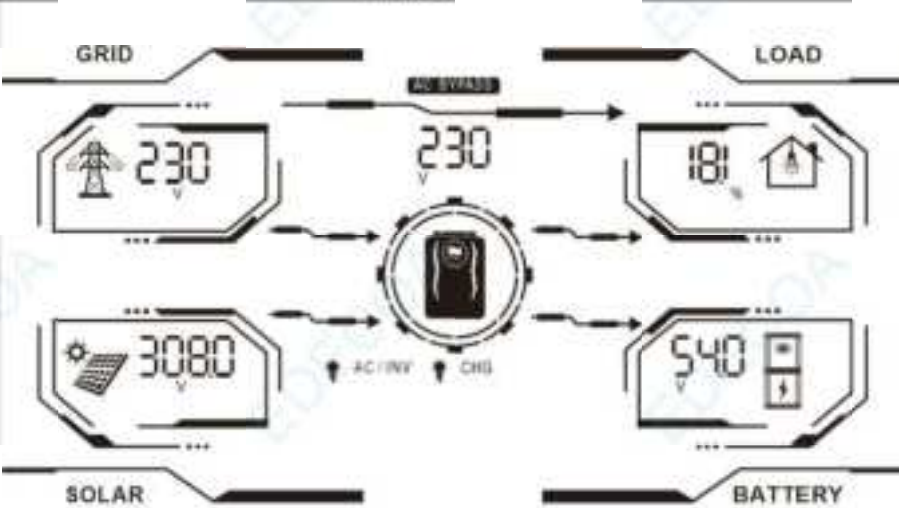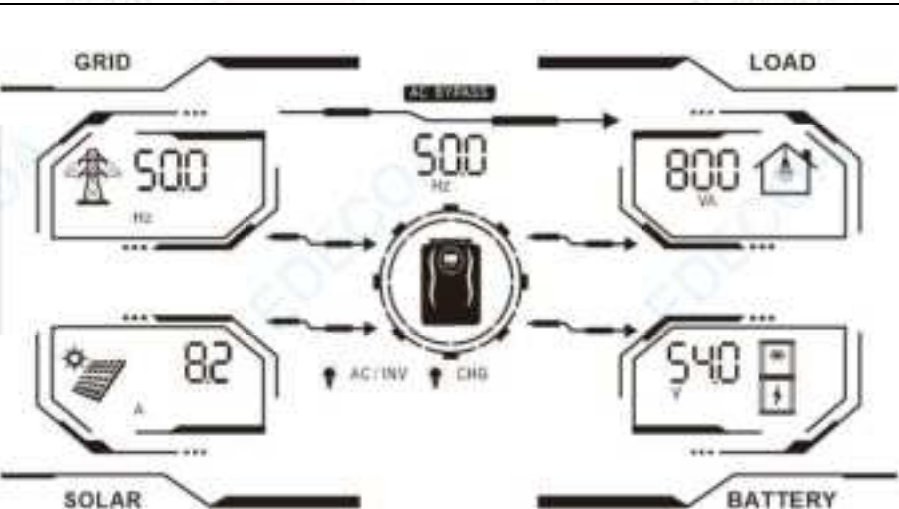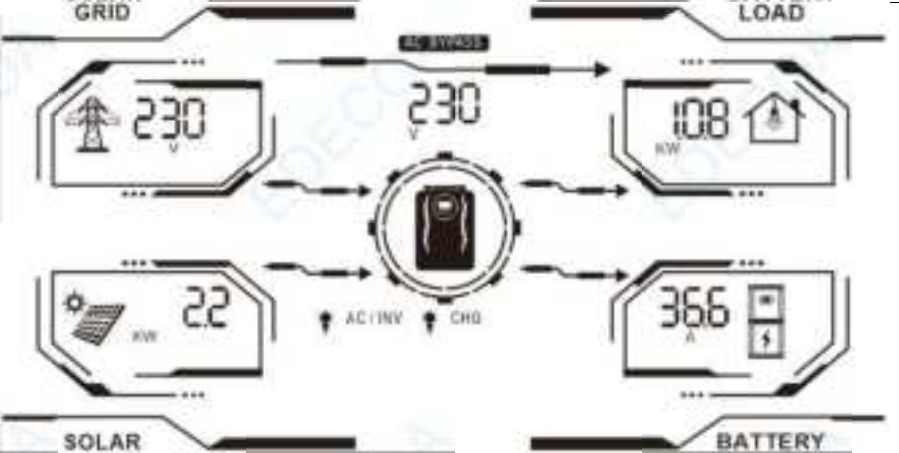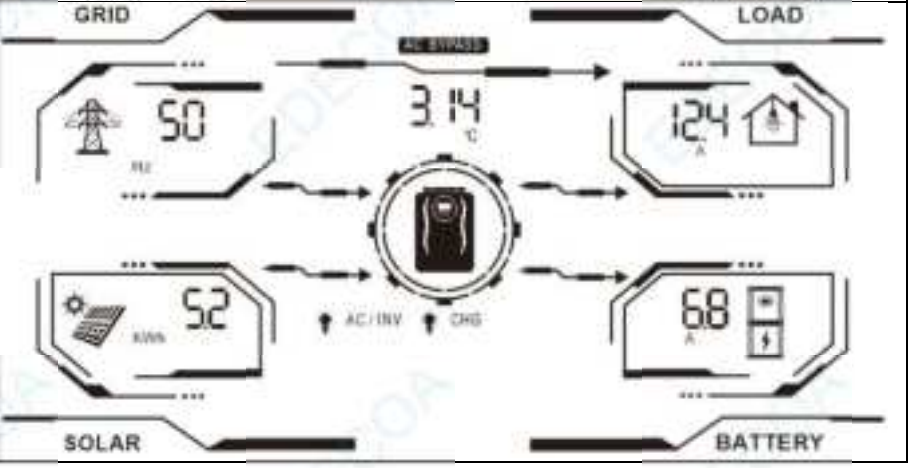
6. Fault Code

Error Code	Error Event	Error Icon
21	Battery cell over-voltage	[21] ERROR
22	Battery cell low voltage	[22] ERROR
23	Single battery cell over-voltage	[23] ERROR
24	Single battery cell low voltage	[24] ERROR
25	Charging over-current	[25] ERROR
26	Discharging over-current	[26] ERROR
27	Charging cell high temperature	[27] ERROR
28	Discharging cell high temperature	[28] ERROR
29	Charging cell low temperature	[29] ERROR
30	Charging cell high temperature	[30] ERROR
61	Communication error	[61] ERROR

LCD Display Information
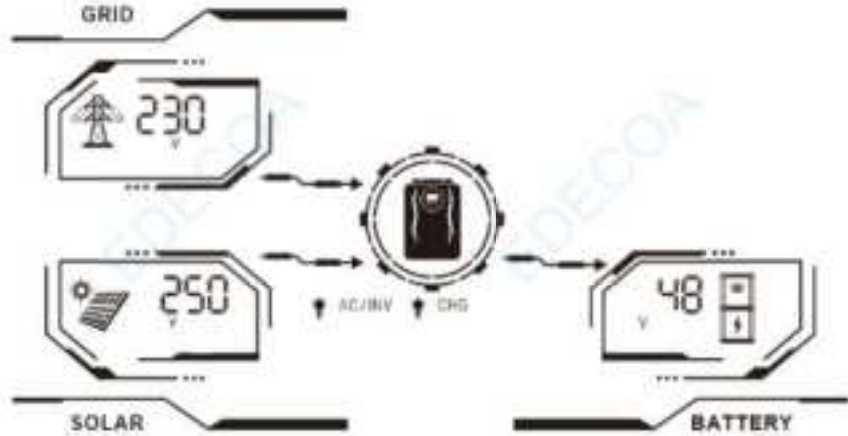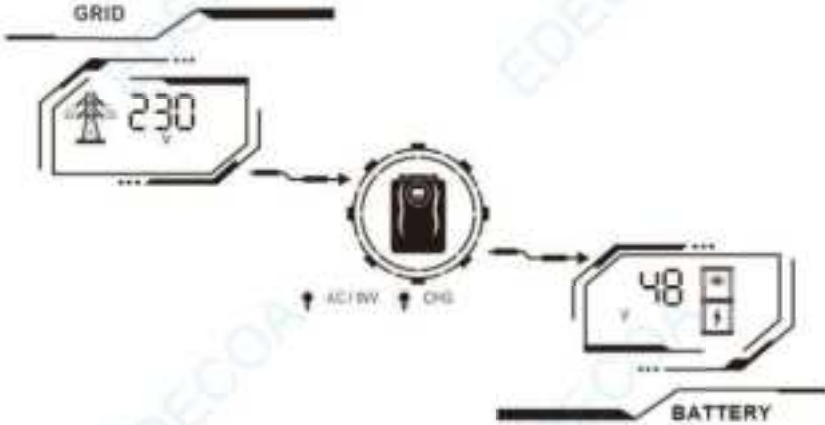
The LCD display information can be switched in turns by pressing the "UP" or "DOWN" key. Information is displayed in the following order: input voltage, input frequency, PV voltage, charging current, PV power, battery voltage, output voltage, output frequency, load percentage, load in Watt, load in VA, DC discharging current, CPU Version.
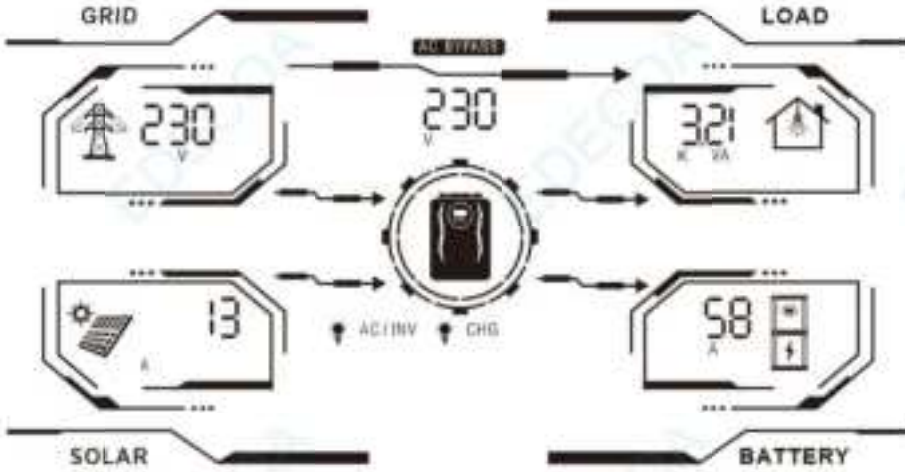
Information	LCD display
Default Display Screen 1. AC Input voltage 2. Output voltage 3. Load percentage 4. PV input voltage 5. Battery Voltage	
1. AC Input frequency 2. Output frequency 3. Load power rate in VA 4. PV input current 5. Battery Voltage	
1. AC Input voltage 2. Output voltage 3. Load power rate 4. PV input power 5. Battery charging current	
1. AC Input frequency 2. Temperature of inverter 3. Output current 4. PV generated power in kWh 5. Battery charging current	

Top right: PV power generated within the last 30 days Bottom left: PV power generated within the last 365 days Bottom right: PV power generated within the last 24 hours	88 2883 KWh 36
Firmware version	5ł 57 00
Time: 2023-07-26 15:35:06	15 35 6 2023 26 07

Operating Mode Description

Operation mode	Description	LCD display
Standby mode / Power saving mode **Note:** *Standby mode: The inverter is not turned on yet but at this time, the inverter can charge the batteries. *Power saving mode: If enabled, the output of inverter will be off when connected load is pretty low or not detected.	No output is supplied by the unit but it still can charge batteries.	Battery charged by utility and PV panels. GRID 230 SOLAR 250 AC/INV CHG 48 BATTERY Battery charged by utility. GRID 230 AC/INV CHG 48 BATTERY

		Battery charging by PV energy.
Utility mode	Utility provides electricity to loads. Batteries can be charged in this mode.	Battery charged by utility and PV.

Battery charged by utility.
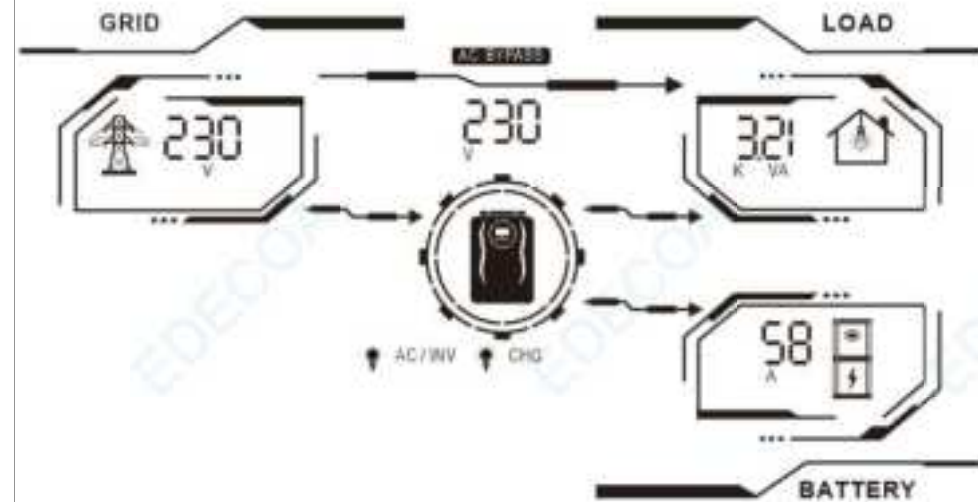
Inverter runs without battery.
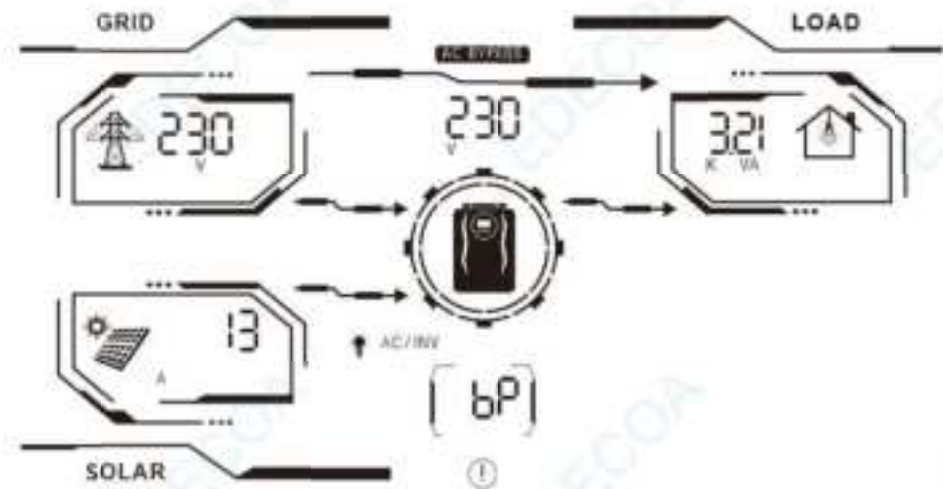
		Solar panels (PV) and battery provide electricity to loads.
Inverter Mode	Solar panels (PV) and battery provide electricity to loads.	 **Battery provides electricity to loads.**
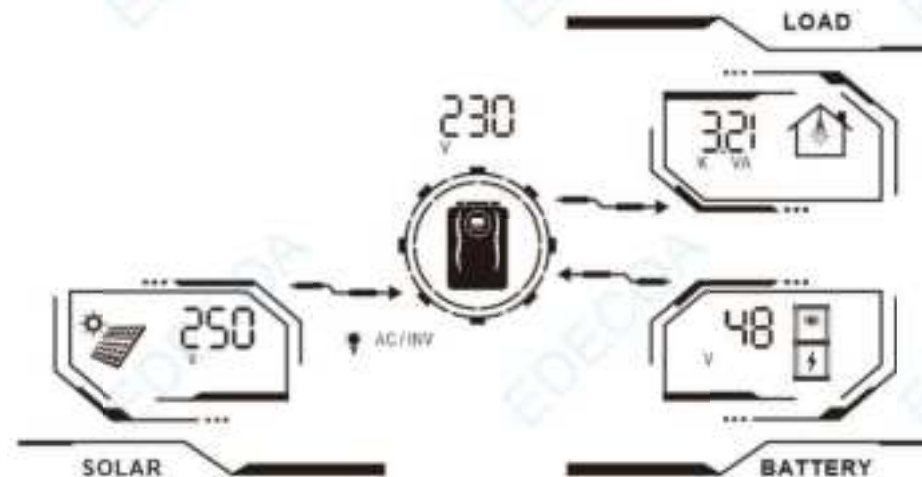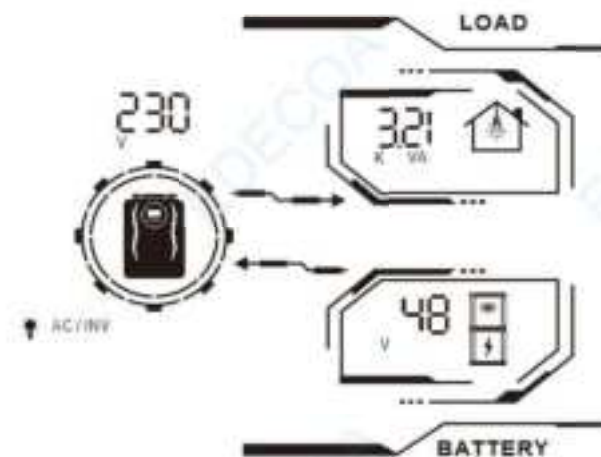
Battery Equalization Description

Equalization function is added into charge controller. It reverses the buildup of negative chemical effects like stratification, a condition where acid concentration is greater at the bottom of the battery than at the top. Equalization also helps to remove sulfate crystals that might have but up on the plates. If left unchecked, this condition, called sulfation, will reduce the overall capacity of the battery. Therefore, it's recommended to equalize the battery periodically.

● How to Apply Equalization Function

You must enable the battery equalization function in monitoring LCD setting program 30 first. Then, you may apply this function in the device by either one of the following methods:

1. Setting equalization interval in program 37.
2. Active equalization immediately in program 39.

● When to Equalize

In the float stage, when the setting equalization interval (battery equalization cycle) arrives, or equalization is active immediately, the controller will start to enter Equalize stage.
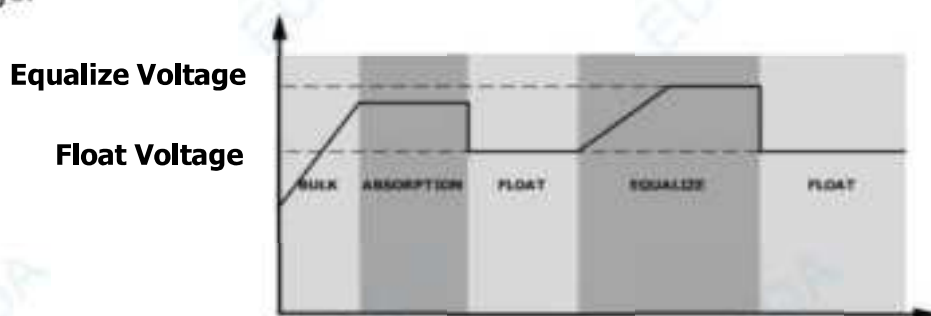
● Equalize charging time and timeout

In Equalize stage, the controller will supply power to charge the battery as much as possible until the battery voltage raises to the battery equalization voltage. Then, constant-voltage regulation is applied to maintain the battery voltage at the battery equalization voltage. The battery will remain in the Equalize stage until setting battery equalized time is arrived.
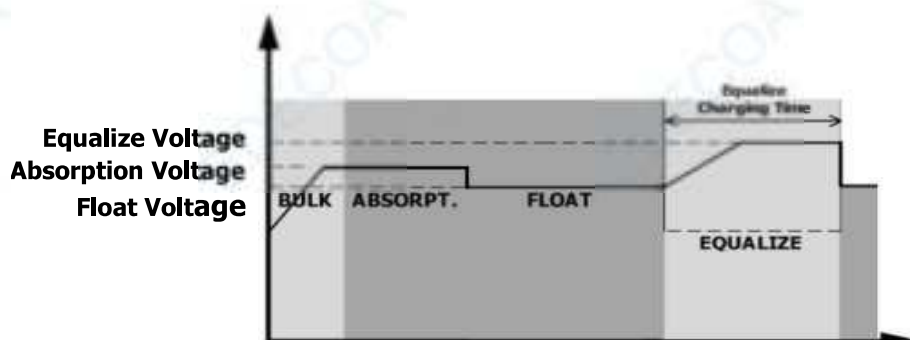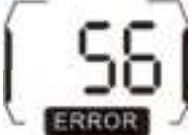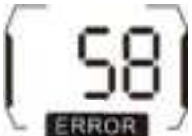
However, in Equalize stage, when battery equalized time is expired and battery voltage doesn't rise to battery equalization voltage point, the charge controller will extend the battery equalized time until battery voltage achieves battery equalization voltage. If battery voltage is still lower than battery equalization voltage when battery equalized timeout setting is over, the charge controller will stop equalization and return to float stage.
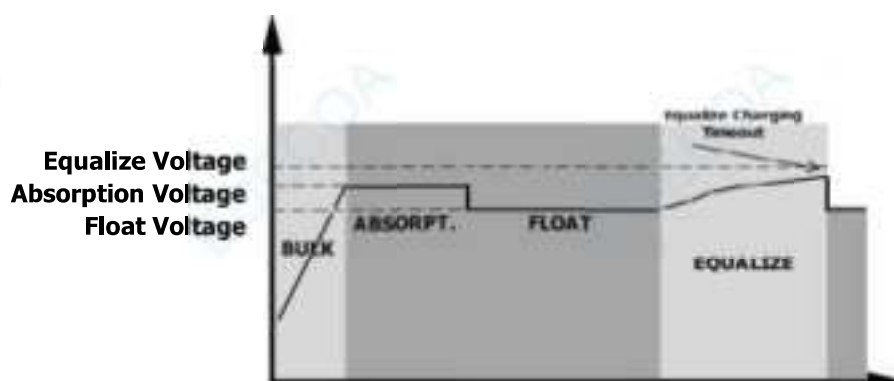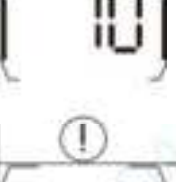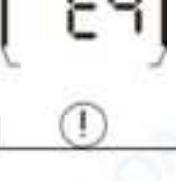
Fault Reference Code

Code/Icon	Fault Event	Code/Icon	
01 ERROR	Fan is locked when inverter is off	07 ERROR	Overload time out
02 ERROR	Over temperature	08 ERROR	BUS voltage is too high
03 ERROR	Battery voltage is too high	09 ERROR	BUS soft start failed
04 ERROR	Battery voltage is too low	13 ERROR	Over-voltage from PV panels
05 ERROR	Output short circuited or over temperature is detected by internal converter components	51 ERROR	Over-current or surge
06 ERROR	Output voltage is too high	52 ERROR	BUS voltage is too low
53 ERROR	Inverter soft start failed	55 ERROR	Over DC voltage in AC output

56 ERROR	Loosen battery connection/battery disconnected	**57** ERROR	Electrical current sensor failed
58 ERROR	Output voltage is too low		
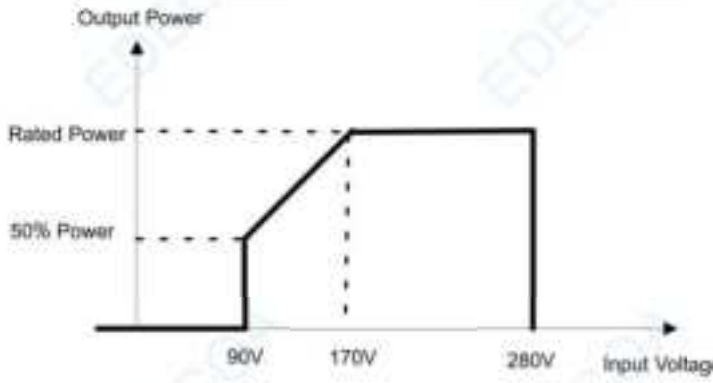
Warning Indicator

Warning Code	Warning Event	Audible Alarm	Icon flashing
01	Fan is locked when inverter is on.	Beep three times every second	**01** !
03	Battery is over-charged	Beep once every second	**03** !
04	Low battery	Beep once every second	**04** !
07	Overload	Beep once every 0.5 second	**07** !
10	Output power derating	Beep twice every 3 seconds	**10** !
15	PV is weak		**15** !
EQ	Battery equalization		**E9** !

BP	No battery connected		bP

SPECIFICATIONS

Table 1 Line Mode Specifications

INVERTER MODEL	EM-452A	EM-654A
Input Voltage Waveform	Sinusoidal (utility or generator)	
Nominal Input Voltage	230Vac	
Low Loss Voltage	170Vac± 7V（UPS） 90Vac± 7V (Appliances)	
Low Loss Return Voltage	180Vac± 7V（UPS） 100Vac± 7V (Appliances)	
High Loss Voltage	280Vac± 7V	
High Loss Return Voltage	270Vac± 7V	
Max AC Input Voltage	300Vac	
Nominal Input Frequency	50Hz / 60Hz (Auto detection)	
Low Loss Frequency	40±1Hz	
Low Loss Return Frequency	42±1Hz	
High Loss Frequency	65±1Hz	
High Loss Return Frequency	63±1Hz	
Output Short Circuit Protection	Utility mode: Circuit Breaker Battery mode: Electronic Circuits	
Efficiency (Line Mode)	>95% (Rated R load, battery full charged)	
Transfer Time	10ms typical (UPS); 20ms typical (Appliances)	
Output power derating: When AC input voltage drops to 170V, the output power will be derated.		

Table 2 Inverter Mode Specifications

INVERTER MODEL	EM-352A	EM-654A
Rated Output	3800W	6200KW
Output Voltage Waveform	Pure Sine Wave	
Output Voltage Regulation	230Vac±5%	
Output Frequency	60Hz or 50Hz	
Peak Efficiency	95%	
Overload Protection	5s@≥150% load; 10s@110% ~ 150% load	
Surge Capacity	2* rated power for 5 seconds	
Nominal DC Input Voltage	24 Vdc	48 Vdc
Cold Start Voltage	23.0 Vdc	46.0Vdc
Low DC Warning Voltage		
@ Load<20%	22.0Vdc	44.0Vdc
@ 20%≤Load<50%	21.4Vdc	42.8Vdc
@ Load≥50%	20.2Vdc	40.4Vdc
Low DC Warning Relieving Voltage		
@ Load<20%	23.0Vdc	46.0Vdc
@ 20%≤Load<50%	22.4Vdc	44.8Vdc
@ Load≥50%	21.2Vdc	42.4Vdc
Low DC Cut-off Voltage		
@ Load<20%	21.0Vdc	42.0Vdc
@ 20%≤Load<50%	20.4Vdc	40.8Vdc
@ Load≥50%	19.2Vdc	38.4Vdc
High DC Recovery Voltage	29Vdc	58Vdc
High DC Cut-off Voltage	31Vdc	62Vdc
No Load Power loss	<25W	<50W
ECO mode power loss	<10W	<15W

Table 3 Double Output Specification

Model	EM-352A	EM-654A
Full load	3800W	6200W
Main output Maximum load	3800W	6200W
EPS output Maximum load (Battery mode)	1200W	2000W
Main output cut-off voltage	22V	44V
Main output recovery voltage (Same as program 13 setting)	27V	54V

Table 4 Charging Mode Specifications

Utility Charging Mode

INVERTER MODEL		EM-352A	EM-654A
Charging Current (UPS) @ Nominal Input Voltage		80A	
Bulk Charging Voltage	**Flooded Battery**	29.2	58.4
	AGM/Gel Battery	28.2	56.4
Floating Charging Voltage		27Vdc	54Vdc
Charging Algorithm		3-Step	
Charging Curve			

MPPT Solar Charging Mode

INVERTER MODEL	EM-352A	EM-654A
Maximum Power	6000W	
Rated Solar Power Voltage	240V	
Max. PV Array Open Circuit Voltage	450Vdc	
PV Array MPPT Voltage Range	55-430Vdc	
Maximum open-circuit voltage	450V	
Maximum charging current of utility and solar panels	110A	

Table 5 General Specifications

INVERTER MODEL	EM-352A	EM-654A
Operating Temperature Range	0°C to 55°C	
Storage temperature	-15°C~ 60°C	
Dimension (D*W*H), mm	423*300*120	
Net Weight, kg	7.3	8

TROUBLE SHOOTING

Problem	LCD/LED/ Buzzer	Explanation / Possible cause	What to do
Unit shuts down automatically during startup process.	LCD/LED and buzzer will be activated for 3 seconds and then off.	The battery voltage is too low	1. Re-charge battery. 2. Replace battery.
No response after power on.	No indication.	1. The battery voltage is far too low. 2. Battery polarity is connected reversed.	1. Check if batteries and the wiring are connected well. 2. Re-charge battery. 3. Replace battery.
Utility connected but the unit works in battery mode.	Input voltage is displayed as 0 on the LCD and green LED is flashing.	Input protector is tripped.	Check if AC breaker is tripped and AC wiring is connected well.
	Utility icon and LED are flashing	Insufficient quality of AC power (utility or generator)	1. Check if AC wires are too thin and/or too long. 2. Check if generator (if applied) is working well or if input voltage range setting is correct. (UPS→APL)
	Utility icon is on and LED is flashing	Solar panel was set as the priority of input source.	Change input source priority to Utility first.
When the unit is turned on, internal relay is switched on and off repeatedly.	LCD display and LED are flashing	Battery is disconnected.	Check battery wire connections.

36

Buzzer beeps continuously and red LED is on.	Fault code 07	Overload. Load reaches 110% rated power and has lasted longer than limit.	Reduce the connected load by switching off some equipment and restart.
Buzzer beeps continuously and red LED is on.	Fault code 05	Output short circuited.	Check connection of circuits and remove abnormal loads.
	Fault code 02	Internal temperature of inverter component is too high	Check whether the air ventilation of the unit is good.
	Fault code 03	Battery is over-charged.	Contact sales team.
		The battery voltage is too high.	Check if specification and quantity of batteries have met requirements.
	Fault code 01	Fan fault	Replace the fan.
	Fault code 06/58	Output abnormal	1.Reduce the connected load. 2.contact sales team
	Fault code 08/09/53/57	Internal components failed.	Contact sales team.
	Fault code 51	Over-current or surge.	Restart the unit, if the error happens again, please contact sales team
	Fault code 52	Bus Voltage is too low.	
	Fault code 55	Output voltage is unbalanced.	

*Product technical specifications are subject to change without notice.

Visit our official website for more information